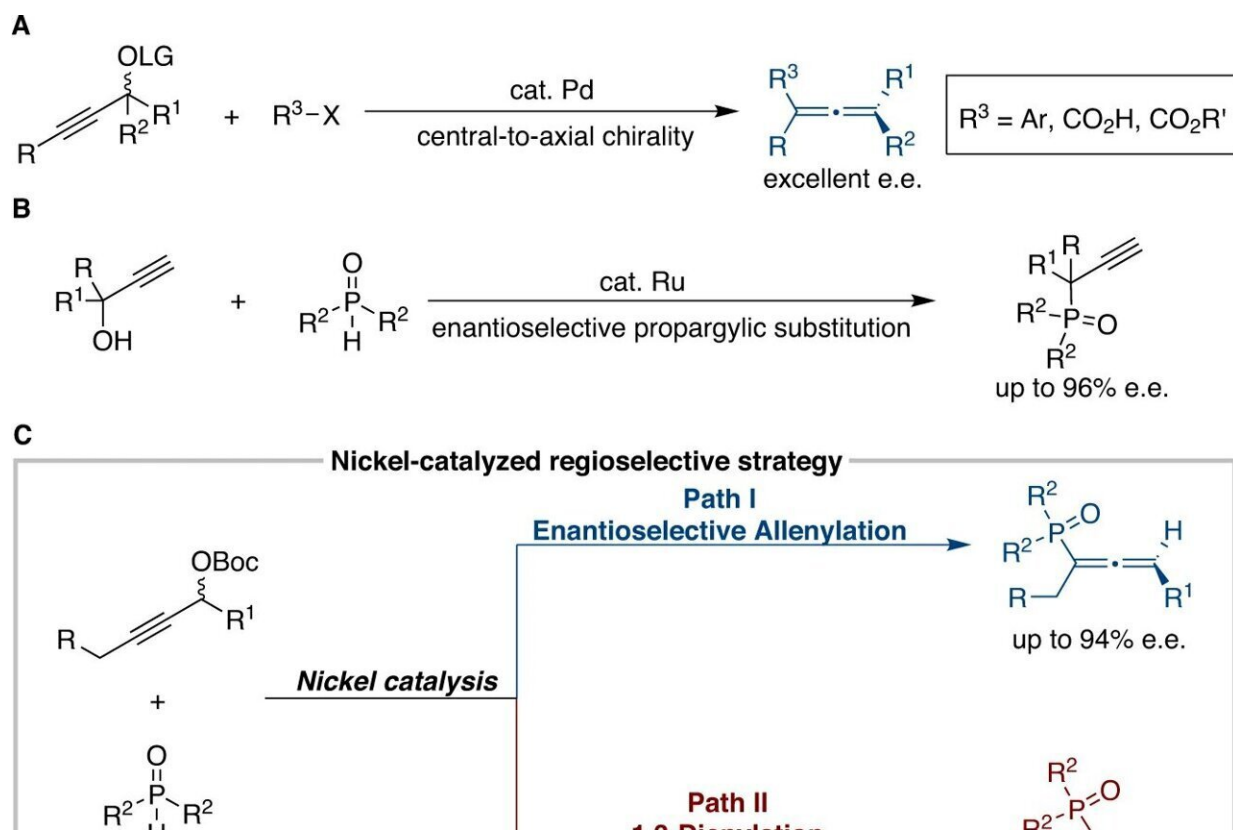


# New strategy for the synthesis of axially chiral allenic compounds

December 9 2022



Nickel-catalyzed regioselective strategy for 1,3-dienylation and enantioselective allenylation. **A** Pd-catalyzed enantioselective allenylation. **B** Ru-catalyzed enantioselective propargylic phosphinylation. **C** This work: Ni-catalyzed 1,3-dienylation and enantioselective allenylation. Credit: *Nature Communications* (2022). DOI: 10.1038/s41467-022-34764-x

Recently, a Chinese research team led by Prof. Guo Chang at the University of Science and Technology of China (USTC) of the Chinese Academy of Sciences (CAS) managed to catalyze an asymmetric propargyl substitution reaction with a nickel-derived catalyst, successfully synthesizing a series of chiral dienes in a diversified route.

Their work was published in *Nature Communications* and *Journal of the American Chemical Society*.

Due to their unique structural characteristics, allenic compounds have been widely used in synthetic chemistry, pharmaceutical chemistry and materials science. They also function as important structures in a wide range of efficient construction of various bioactive molecules. The [development](#) of efficient and highly selective [synthesis](#) methods to construct novel chiral allenic compounds has been a research focus.

The researchers managed to realize the diversified phosphorylation of racemic propargyl carbonate and synthesized a series of tertiary phosphine oxides effectively by applying two different ligands. One is to synthesize functionalized phosphinoyl 1,3-butadienes with the ligand dcybpz. While the other one is realizing the construction of versatile chiral allenylphosphoryl derivatives with high enantiopurity by applying the newly developed BDPP-type ligand.

Additionally, the team designed a series of N-sulfonyl hydrazide reagents, which were used in the [nickel](#) catalyzed asymmetric propargyl substitution/Myers rearrangement tandem reaction, achieving a high stereoselectivity in the synthesis of 1,3-disubstituted allenic compounds. This powerful strategy can be applied in the synthesis of natural allenic compounds, indicating its great potential.

**More information:** Jiayin Zhang et al, Nickel-catalyzed switchable 1,3-dienylation and enantioselective allenylation of phosphine oxides,

*Nature Communications* (2022). [DOI: 10.1038/s41467-022-34764-x](https://doi.org/10.1038/s41467-022-34764-x)

Xianghong Xu et al, Nickel-Catalyzed Asymmetric Propargylation for the Synthesis of Axially Chiral 1,3-Disubstituted Allenes, *Journal of the American Chemical Society* (2022). [DOI: 10.1021/jacs.2c10863](https://doi.org/10.1021/jacs.2c10863)

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